Exhibition and Seminar on Science and Creative Technology, University of Al-Azhar Indonesia (EXSACT-A 2024) Proceeding

DOI: http://dx.doi.org/10.36722/exc.v2i1.3326

User Centered Design Method for Designing a Student Organization Information System at the University of Al Azhar Indonesia

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Abstract — **University of Al Azhar Indonesia (UAI) has 39 student organizations that serve as a forum for student development in various fields, both academic and non-academic. Currently, in the administration and documentation of student organization activities, they still use Google Form, Google Drive, and Google Sheets. The use of these platforms creates a major problem when submitting activity proposals, as there is no submission history that can result in duplicate submissions and affect the review time by the Student and Alumni Council. This research aims to develop a web-based information system that can facilitate student organization administrators and activity reviewers in carrying out UAI student organization administration. The development of this system adopts the User Centered Design (UCD) method, a design approach that focuses on user needs so that the end result of the application does not change user behavior. The UCD method consists of four stages, namely planning human-centered design, determining user and organizational needs, designing product solutions, and evaluating designs based on user needs.**

Abstrak — **Universitas Al Azhar Indonesia (UAI) memiliki 39 organisasi mahasiswa yang berfungsi sebagai wadah pengembangan mahasiswa di berbagai bidang, baik akademik maupun nonakademik. Saat ini dalam administrasi dan dokumentasi kegiatan organisasi kemahasiswaan masih menggunakan Google Form, Google Drive, dan Google Sheets. Penggunaan platform ini menimbulkan masalah besar saat mengajukan proposal kegiatan, karena tidak ada riwayat pengajuan yang dapat mengakibatkan pengajuan ganda dan memengaruhi waktu peninjauan oleh Dewan Mahasiswa dan Alumni. Penelitian ini bertujuan untuk mengembangkan sistem informasi berbasis web yang dapat memudahkan pengurus organisasi kemahasiswaan dan peninjau kegiatan dalam melaksanakan administrasi organisasi kemahasiswaan UAI. Pengembangan sistem ini mengadopsi metode *User Centered Design* (UCD), yaitu pendekatan desain yang berfokus pada kebutuhan pengguna sehingga hasil akhir aplikasi tidak mengubah perilaku pengguna. Metode UCD terdiri dari empat tahap, yaitu perencanaan desain yang berpusat pada manusia, penentuan kebutuhan pengguna dan organisasi, perancangan solusi produk, dan evaluasi desain berdasarkan kebutuhan pengguna.**

Keywords *— User centered Design, Information System, Student Organization*

INTRODUCTION

University students are individuals pursuing higher education with the goal of obtaining academic degrees. In 2022, Indonesia's Central Statistics Agency (BPS) recorded a total of 7.9 million university students across the country [1], a number that continues to grow each year due to population growth and increased access to higher education. These students play significant roles in society, as highlighted in a study by Habib Cahyono [2], which identifies four key roles: agents of change, social control, iron stock, and moral force. Through these roles, students drive societal progress, critique social structures, and embody the potential for future leadership and innovation.

Higher education institutions are instrumental in shaping these roles through the implementation of the Tridharma Perguruan Tinggi, which encompasses education, research, and community service. These pillars aim to produce well-rounded individuals capable of contributing positively to society. Student organizations, such as the Badan Eksekutif Mahasiswa (BEM), Himpunan Program Studi, and Unit Kegiatan Mahasiswa (UKM), serve as platforms for students to hone their skills and fulfill their societal roles. These organizations provide numerous benefits, including leadership development, enhancement of social skills, network expansion, and increased social awareness.

At the University of Al Azhar Indonesia (UAI), student organizations are well-supported, with 39 student organizations currently active [3]. The effective administration of these organizations is crucial for maintaining order, managing resources, and ensuring proper documentation and archiving. However, the current administrative processes, which rely on tools like Canva's Link Tree, Google Forms, and Google Sheets, present several challenges. For instance, the submission process often leads to repeated submissions due to the lack of submission tracking, while monitoring administrative progress is cumbersome as data is mixed and constantly changing across different student organizations.

An observation conducted by the author revealed that these challenges significantly hinder the operations of student organizations. Interviews with Jatmiko Agus Nugroho, S.Kom., M.H., Head of the Directorate of Student Interests and Organizations at UAI, further confirmed these issues. He noted that validating administrative submissions is time-consuming due to the mixed data, and accessing archived documents is difficult due to the unstructured nature of the current system.

To address these challenges, this paper proposes a solution through the development of a Student Organization Information System for UAI, utilizing the User-Centered Design (UCD) method [4][5]. This system will offer features such as submission tracking, targeted administrative monitoring, and a centralized repository for document archiving, making it easier for student organization members, the Student Organization Coordinator, and DKA to manage and access administrative information.

The UCD approach ensures that the system is designed with a focus on the needs and preferences of its users—students, DKA, and the student organization advisors—thereby creating a system that is more intuitive, efficient, and effective in supporting the administrative functions of UAI's student organizations.

METHOD

Research Framework

This research framework is based on the User Centered Design method for developing a student organization information system at UAI, aimed at creating a system design that aligns with user needs. The UCD approach emphasizes the active participation of users throughout the design process to ensure the system meets their expectations and requirements. By incorporating user input and iterative improvements, this framework seeks to develop a user-friendly and tailored information system that addresses the specific needs of the student organizations.

The UCD process involves four main steps as in Figure 1 and the following explanations.

1. **Understanding the Context of Use**: This step involves gathering detailed information about the users, their tasks, and the environment in which the system will be used. It ensures that the design team has a clear understanding of the real-world context and the problems that need to be addressed.
2. **Specifying User Requirements**: After understanding the context, specific user needs and requirements are identified and

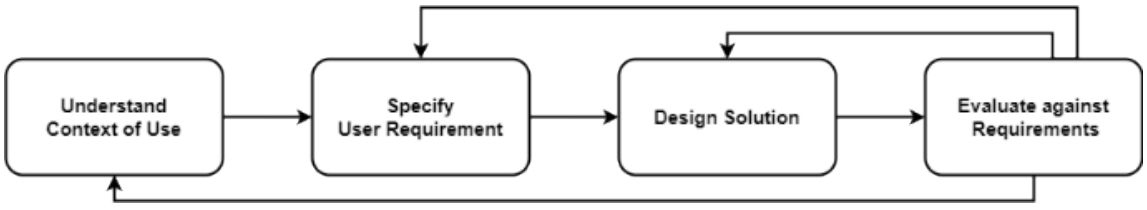

Figure 1. Research Framework

documented. This step ensures that the system will have the necessary features and functionalities to meet user expectations**.**

3. **Designing Solutions**: In this phase, the system's design is developed through prototypes and models based on user requirements. This step involves creating multiple design iterations to refine the solution, incorporating feedback from users at each stage.
4. **Evaluating Against Requirements**: The final step is to evaluate the design against the identified user requirements. This involves testing the system with real users to ensure it is effective, efficient, and satisfying. Any issues identified during this step are addressed in further design iterations [4].

These steps are iteratively repeated to refine the design until the final system effectively meets the users' needs and expectations.

Data Collection Technique

In this research process, supporting data for designing the student organization information system at UAI was collected in several ways, such as direct observation to understand the ongoing administrative processes of the student organizations at UAI, interviews with student organization stakeholders by randomly selecting respondents, and conducting a survey using questionnaires to gather data for the evaluation of the design draft. The direct observation allowed the researchers to identify inefficiencies and pain points in the current administrative workflow. Interviews provided in-depth insights into the specific needs and expectations of different stakeholders, ensuring the system would cater to a broad range of user requirements. The survey data was crucial for validating the proposed design solutions and ensuring that the final system would be user-friendly and meet the identified needs of the student organizations.

RESULTS AND DISCUSSIONS

Results

Based on the method used in this research, which is UCD, the author obtained results in accordance with the stages of the implemented method. In the 'Understand Context of Use' stage, after conducting direct observations of the ongoing administrative activities of student organizations at UAI, the author transformed two administrative activities that occur in these student organizations: the submission of administrative requests by student organization officials and the review of these requests by the coordinator of the student organizations as well as the DKA staff.

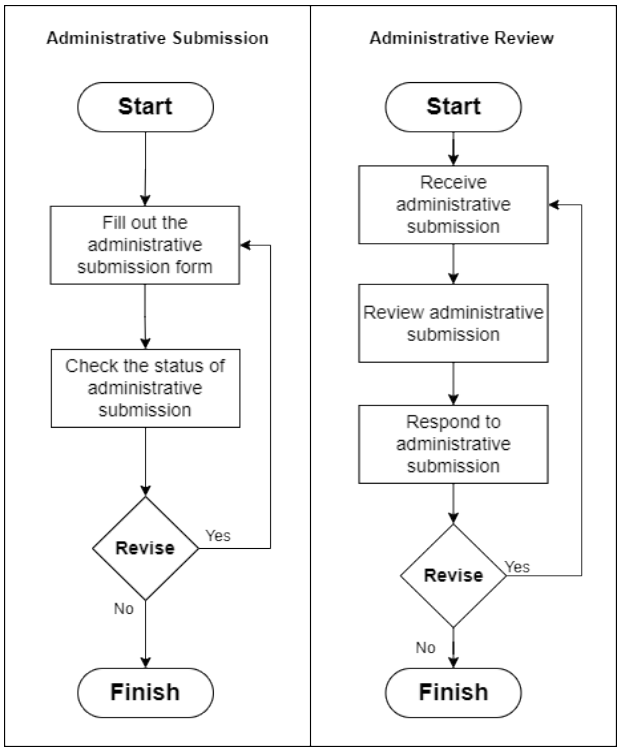

Figure 2. Administrative Processes Flowchart

Based on the administrative activities carried out in the implementation of student organizations at UAI, the context of use for the student organization information system at Universitas Al Azhar Indonesia will be as a tool to conduct these administrative activities within a single system.

After the context of system use is identified, the author conducts interviews with all parties involved in the student organization administration process to understand their specific needs. This is an implementation of the 'specify user requirements' stage, which results in an output in the form of a user persona table.

Three user personas are presented. Table 1 shows the persona of student organization members, or just students. Table 2 shows the student organization's coordinator, appointed for each organization. Table 3 is the DKK or the campus administration in charge of student activity.

Tabel 1. Student Organization's Member Persona

Demographic	1. **Age:** 19-23 years 2. **Gender:** Male and Female 3. **Role:** Student Organization's member
Psychographics	1. Using a smartphone for daily activities and operating a laptop for learning purposes. 2. Frequently accessing websites/online platforms.
Skills	1. Experienced in using technological devices like smartphones and desktops. 2. Familiar with using search engines to access websites. 3. Regularly uses the internet.
Problems	The administrative process, which is done manually using Google Sheets, causes several issues, such as data duplication, lost history, and confusing tracking of submission progress. This leads to difficulties in monitoring by the DKA.
Needs	An application that can facilitate the administrative activities of UAI student organizations, eliminating issues of submission duplication, administrative submission pages, and monitoring pages that are not mixed up with all UAI organizations.

Table 2. Student Organization's Coordinator Persona

Demographic	1. **Age:** 30-50 years 2. **Gender:** Male and Female 3. **Role:** Student Organization's coordinator
Psychographics	1. Using a smartphone for daily activities and operating a laptop for learning purposes. 2. Frequently accessing websites/online platforms.
Skills	1. Experienced in using technological devices like smartphones and desktops. 2. Familiar with using search engines to access websites. 3. Regularly uses the internet.

After the user requirements were identified, the author designed the system according to the user's needs. The design solution created by the team is shown in Figure 3 to 12.

Table 3. DKA Staff Persona

Demographic	1. **Age:** 30-50 years 2. **Gender:** Male and Female 3. **Role:** DKA Staff
Psychographics	1. Using a smartphone for daily activities and operating a laptop for learning purposes. 2. Frequently accessing websites/online platforms.
Skills	1. Experienced in using technological devices like smartphones and desktops. 2. Familiar with using search engines to access websites. 3. Regularly uses the internet.
Problems	The review process of administrative submissions is done manually using Google Sheets, which complicates tracking the progress of submissions from various organizations. This also leads to confusion when responding to administrative tasks, as users need to look through many different lists and access multiple Google Sheet tabs.
Needs	An application that can facilitate the administrative activities of UAI student organizations, ensuring that the review and validation process can be done in one integrated page for each organization being supervised.

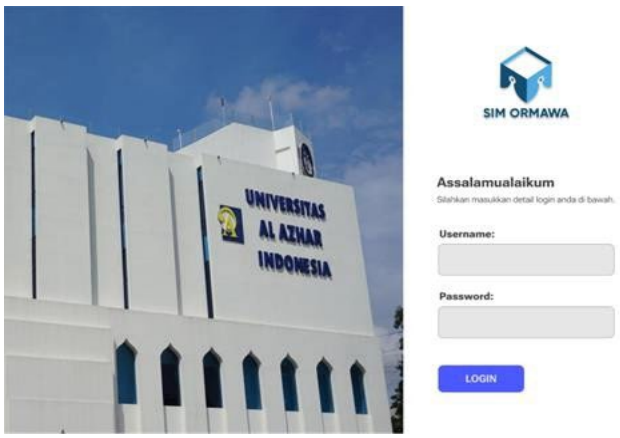

Figure 3. Login Page

The High Fidelity Prototype of the design solution that has been created will then be tested on users using the Single Ease Question method. Single Ease Question (SEQ) is a test conducted after users complete each assigned task. The tester will ask the user to rate, overall, how easy it was to complete the given task [4].

Figure 4. Dashboard Page - Organization's Member

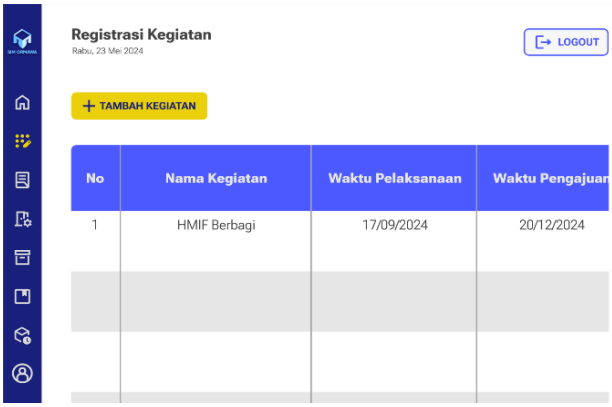

Figure 5. Event Submission Page

Figure 6. Facilities and Infrastructure Submission

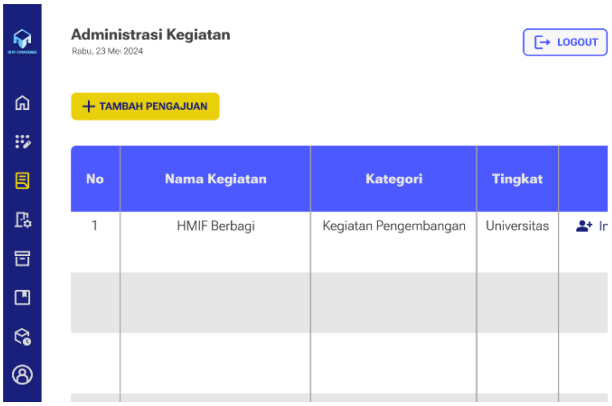

Figure 7. Administrative Submission

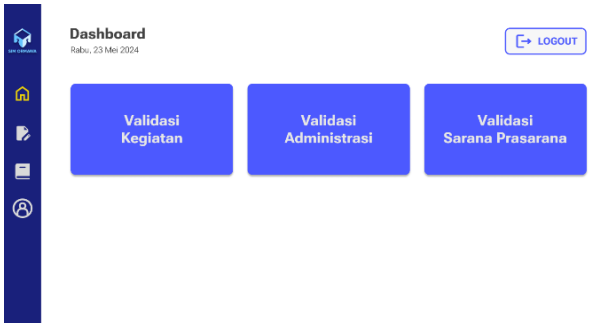

Figure 8. Dashboard Page - DKA Staff

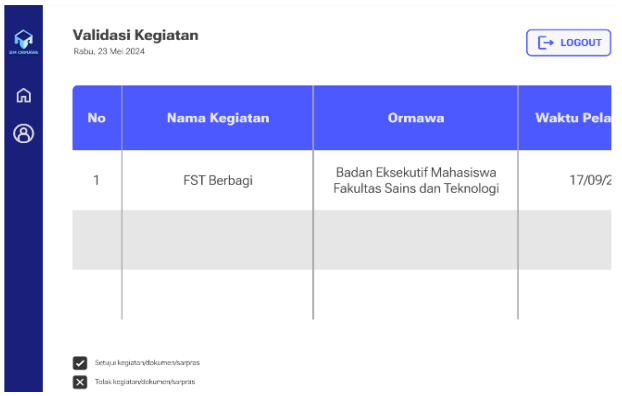

Figure 9. Event Review Page

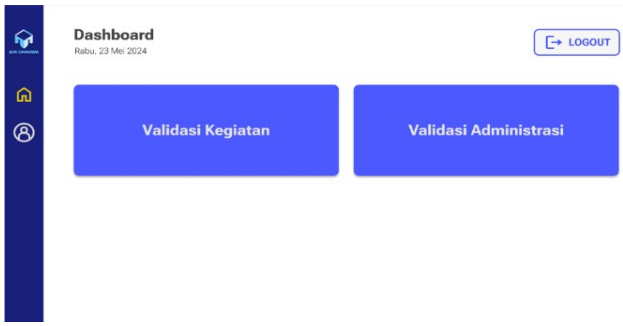

Figure 10. Dashboard Page – Organization's Coordinator

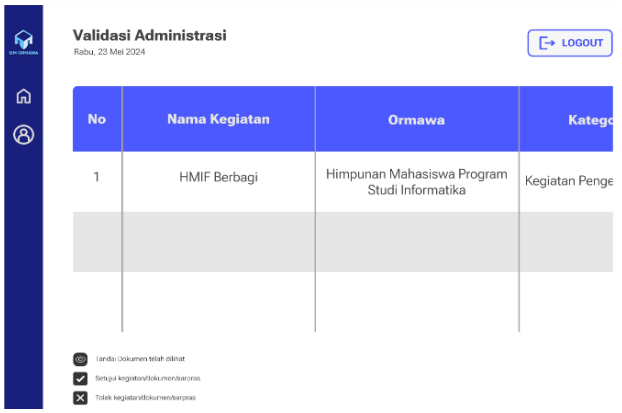

Figure 11. Administrative Review Page

Figure 12. Facilities and Infrastructure Review

This testing method will be used to evaluate the system design. According to Sauro & Lewis, SEQ consists of a single question with a Likert scale from 1 to 7, with the options: very difficult, difficult, somewhat difficult, neutral, somewhat easy, easy, and very easy [5]. Based on these ratings, a task is considered difficult if it scores below 5 on the SEQ scale [6]. SEQ is conducted each time a user completes a feature on the system to finish a task; 1 SEQ is only applicable for 1 task and is asked once the user has completed each task. If a task has an SEQ score below 5, the task is considered difficult and should be evaluate [7].

The table 4 and 5 are the results of system design testing conducted on users using the SEQ method.

Table 4. Testing Scenario

Task
Login
Logout
Adding activities on the Event Submission Page
Adding administration of activities on the Administrative Submission Page
Adding equipment borrowing on the Facilities and Infrastructure page

Table 5. Testing Result

Task	Respondent					AVG
	1	2	3	4	5	
1	7	7	6	6	7	**6.6**
2	7	7	6	6	7	**6.6**
3	7	7	6	6	7	**6.6**
4	7	7	7	7	7	**7**
5	7	7	6	6	7	**6.6**

Discussion

Based on the research results described above, the system design testing received an average score of more than 5, indicating that the system design is user-friendly and aligns with user needs. This suggests that the UCD (User-Centered Design) method successfully aided in designing the student organization information system at Universitas Al Azhar Indonesia to meet user requirements.

CONCLUSION

Several conclusions can be drawn from the results of this study, including that the design of the student organization information system at Universitas Al Azhar Indonesia was successfully created based on user needs data. The UCD method was successfully implemented and helped achieve the research goal of designing a student organization information system that meets user needs. This is evidenced by the results of system design testing using the SEQ method, with an average score of each feature being greater than or equal to 5, which is the minimum passing score for the test.

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